REMARKS:

Claim 17 was rejected under 35 U.S.C. §112, second paragraph. This rejection has been rendered moot by canceling claim 17.

Claims 16-17, 23, 24, 29-33 and 35-37 were rejected under 35 U.S.C. §103 as being obvious over the teachings of Roulin et al (United States Patent 5,508,075) in view of the teachings of Hayashi (United States Patent 5,000,991) and Nankee et al (United States Patent 4,543,364). However, the claims pending in the subject patent application have been amended to further distinguish from the teachings of the cited prior art references. It is believed that this amendment overcomes the rejections made under 35 U.S.C. §103(a) over the collective teachings of the cited prior art references. In light of this amendment, the Examiner is accordingly respectfully requested to reconsider the rejections made under 35 U.S.C. §103(a).

The application, as currently amended, introduces two new limitations into both the independent claims 36 and 38. The first limitation is that the foamed sheet, the heat sealable film, and glue, if used, are made of polyester resin. In order to achieve recyclability it is necessary that the polymeric elements of the sheet be of the same chemical nature, in this case a polyester. Support for this limitation is found in the specification on page 1, line 21.

The second limitation is that the polyester of the foamed sheet must have a crystallinity of less than 15%. Support for this limitation is found in the amendment to the specification.[1]

As detailed below, the new limitations overcome all the objections raised by the prior art in the November 10, 2003 office action. Each prior art document teaches away from the limitations. While Roulin contains some of the elements of the laminate, it does not disclose that the foamed polyester resin have less than 15% crystallinity and that the laminate use a foamed polyester core, a heat sealable polyester and if used, a polyester glue. The last limitation is essential to the recyclable nature of the laminate and the container and is taught away from by Roulin. Roulin teaches that the container from the laminate be disposable, not recyclable.

---

1 Support for the subject matter added in the first sentence of the amendment to the specification is found in United States Patent 5,362,736 at column 1, lines 27-30 which was incorporated by reference on page 3, line 25 of the original specification.

Hayashi also teaches away from the currently amended claims. Hayashi teaches that the crystallinity be greater than 15% in order to achieve the necessary heat resistance. This is inapposite to the limitation that the foamed material have less than 15% crystallinity. Colombo teaches away from the currently amended claims as well. Colombo teaches that the laminate be made of dissimilar materials so that they can be separated during the recycling operation. This is diametrically opposed to the limitation that the key elements are made from polyester so they are chemically compatible.

The November 10, 2003 office action rejected the earlier claims over Roulin. While Roulin discloses a foamed polyester, a heat sealable polyester, a creased polyester, and PET, these elements are found in different laminate structures with no motivation within Roulin to combine them into a single laminate.

The foamed polyester core disclosed by Roulin at column 6, lines 17-24 refers to the laminate structure shown in Figure 8. Figure 8 has a foldable foamed core (column 6, line 17), but Roulin does not indicate that the foamed core is creased (column 6, lines 10-39). The creasing of a structure with a foamed polyester core is not disclosed at all in Roulin. The office action of November 10, 2003, referenced column 7, lines 4-14 as establishing a crease in a structure with a foamed polyester core. Column 7, lines 4-14 refer to the laminate structure of Figure 9 (column 6, lines 40 to column 7, lines 14). However, Figure 9 is not directed to a carton but to a flexible bag (column 7, line 1). The difference between a bag's flexibility and a carton's rigid sidewall is detailed in the specification at page 1 line 27 to page 2, line 10. Additionally, the polyester core of Figure 9 cannot be a foamed polyester because it is transparent. Roulin notes that the laminate structure is transparent because "each of the layers is transparent." Column 7, line 13-14. By definition, a transparent layer is not a foamed material.

The heat sealable polyester resin is also disclosed in Figure 9 (column 6, line 60). Again, the laminate of Figure 9 illustrates the transparent wall of a bag and is accordingly not directed to the wall of a carton made with a foamed polyester.

The November 10, 2003 office action noted that Roulin discloses an aromatic polyester by stating PET is the preferred substrate (column 2, line 22). Roulin does not appreciate the significance of the density or the brittleness brought on by crystallization of a foamed polyethylene terephthalate. Additionally, Roulin does not teach that the foamed polyester must have a density of less than 700 kg/m^3 or that the core must be essentially

amorphous and stay below 15% crystallinity upon exposure to heat during the formation of the foamed layer.

The last office action of November 10, 2003 notes that Roulin does not disclose a foamed sheet or a container which is recyclable. Roulin does not teach a laminate which is recyclable as defined in the application. In fact, Roulin teaches away from combining materials of the same chemical nature for the purposes of recyclability. All of Roulin's examples are complex multi-material structures. Such multi-material structures are inherently non-recyclable (see the original specification at page 1, line 20). Nankee also makes this point at column 1, lines 14-25. Roulin teaches away from recyclability in favor of disposability. The object of Roulin is to replace aluminum foil (a recyclable material) with a disposable package or one that is "readily disposable after use" (see column 1, line 27). "A further object [of Roulin] is to provide a packaging laminate that may be readily disposed of without harm to the environment" (see column 1, line 49). Roulin therefore teaches away from combining the elements of the various structures to create a recyclable package. There is therefore no motivation within Roulin to combine the polyester elements of the various structures into one structure. The limitation in the claims pending in the subject patent application that the foam, the heat sealable resin, and the adhesive, if used, all be polyester therefore are not rendered obvious by the teachings of Roulin.

The secondary references fail to supplement the teachings of Roulin in a manner rendering the amended claims obvious. The secondary references are either inapplicable or teach away from the amended claims.

Hayashi is cited as disclosing a foamed polyester sheet with less than 700 kg/m3. However, no motivation exists to use Hayashi. The motivation claimed in the office action was to provide heat insulative properties. It is improper to combine Hayashi with Roulin. Heat insulative properties are not the object of the Roulin. Roulin is aimed at providing gas barrier and aroma barriers (see column 1, lines 1- 21). Hayashi teaches a heat resistant, heat insulative container (see column 1, line 18). Heat insulation has nothing to do with gas and aroma (vapor) barriers and therefore is not a motivating factor to combine the two techniques.[2]

---

2 The teachings of Hayashi cannot be combined with the teachings of Roulin in a manner that renders the composition now being claimed obvious. Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting that combination. ACS Hospital Systems, Inc. v. The

Additionally, Hayashi calls for a crystallinity above 15% in order to attain a container having the desired level of heat resistance (see column 8, line 61-68). Without heat resistance, the container in Hayashi cannot serve a heat insulating function. Hayashi therefore teaches towards fast crystallizing materials that form crystalline foams in the container and therefore teaches away from the essentially amorphous, slow crystallizing polyester core that is now called for in amended claims 36 and 38. It should be noted that Hayashi's density is achieved by heating the foam and causing it to expand during heating. This same heat crystallizes the material making it unfoldable. The amendment that the foam be at less than 15% crystallinity is in direct contradiction with Hayashi's teachings that call for a crystallinity of greater than 15%.

Colombo is cited as disclosing a foamed and non-foamed layer. However, Colombo discloses that the layers be a laminate of two dissimilar materials (see the Abstract). Colombo also teaches away from recyclability based upon chemical compatibility. Colombo teaches that these materials be selected so the laminate can be easily separated during the recycling operation (column 3, Line 15). This is diametrically opposed to the limitation of the amended claims that the foam, the heat sealable material, and glue, if used, all be polyester. This overcomes the motivation to combine Colombo with Roulin.

The November 10, 2003 office action cites Nankee as making the use of PET obvious because PET is recycled. This statement relies on a different use of the term recyclable than the one used in the specification. Recyclable in the specification means that the laminate or container is technically capable of being recycled (page 2, Line 20-26). In order for an object to be recyclable, the materials must have an aftermarket and the recycling process cannot

---

Montefiore Hospital, 732 F.2d 1572, 221 USPQ 929 (Fed. Cir. 1984). Thus, the teachings of Hayashi cannot be combined with the teachings of Roulin in the present case since none of these references suggest such a combination. Persons having ordinary skill in the art would have no logical basis for combining the teachings of Hayashi with the teachings of Roulin. There is no teaching in Hayashi that would motivate a person having ordinary skill in the art to combine certain of its select teachings with those of Roulin while ignoring others.

At the time the subject invention was made, persons having ordinary skill in the art would not have piecemealed together the teachings of the references being cited in the manner suggested by the Examiner. Obviousness is not determined by the application of hindsight, or retrospect, with the knowledge of the patentee's discovery. Rather, it is determined as of the time of the invention, based solely on the knowledge disclosed by the prior art as a whole. Republic Industries, Inc. v. Schlage Lock Co., 592 F.2d 963, 200 USPQ 769 (1979); Schnell v. Allbright-Nell Co., 348 F.2d 444, 146 USPQ 322 (1965).

damage the value of the materials. Dissimilar materials which cannot be separated reduce the recyclability of the article (see the specification at page 2, lines 20-21 and see Nankee at column 1, lines 14-25).

The use of dissimilar materials is the very problem solved by the current amended claims which uses materials of a similar chemical nature. Nowhere does Nankee provide any motivation to substitute polyester materials for the non-polyester materials used in the container. In fact, Nankee's invention is aimed at removing the non-polyester glues from bottles (column 1, line 65 to column 2, line 4) because the contamination by non-polyester components destroys the value of the material. This is the very problem solved by using hot lamination or a polyester based glue as found in the amended claims.

Rejections 5 and 6 are directed towards dependent claims and rely upon Roulin in view of Hayashi and Nankee in further view of Hubbard or The Encyclopedia of Polymer Science and Engineering, respectively. By virtue of the fact that rejections 5 and 6 both rely upon Roulin in view of Hayashi and Nankee, rejections 5 and 6 are addressed in the arguments regarding Roulin, Hayashi, and Nankee. Accordingly, the rejected dependent claims are also allowable since they now carry the limitations found in the amended independent claims.

For the reasons delineated herein, the claims pending in the subject patent application are not obvious over the teachings of the cited references. It is now accordingly appropriate to allow the subject patent application and such an allowance is respectfully requested.

Respectfully submitted,

Agent for Applicant(s)

Edwin A. Sisson, Reg. No. 48,723
M & G Polymers Technology Center
6951 Ridge Road
Sharon Center, Ohio 44274-0590
Telephone: (330) 239-7413